REMARKS

Favorable reconsideration of the above-identified application is requested in view of the following remarks.

Claim 3 is canceled by this Amendment and Claims 1, 2, 4, 5, 9, 10, 12, 13, 17, 18-27, 30-33, 36 and 38 remain canceled. Claims 6, 7, 11, 14-16, 28, 29, 35, 37, 40 and 41 remain withdrawn from consideration.

Claims 6-8, 11, 14-16, 26, 28, 29, 34, 35, 37 and 39-41 are pending in this application, with Claims 8, 26, 34 and 39 being at issue. Claim 39 is the only independent claim at issue.

On page 2 of the Official Action, issues are raised with regard to Claims 3, 26 and 39. Claim 3 is canceled, and Claim 39 is amended, thereby addressing those issues.

Claims 3 and 39 are rejected under 35 U.S.C. § 112, second paragraph. Claim 3 is canceled thereby obviating that rejection. Claim 39 is amended thereby overcoming that rejection.

Claim 39 is rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,270,199, hereinafter *Kimura*.

Kimura discloses a liquid ejecting head and device including a liquid floor path having bubble generation heat elements used to generate bubbles having different sizes, and a movable mechanism having at least one movable member arranged to face a bubble generation region formed in the liquid flow path. That is, electric current is applied to heat generating elements 2-1 and 2-2 to heat the ink and create bubbles that propel the ink. The heat generating elements 2-1 and 2-2 are different than piezoelectric elements, as referred to in the present application, which deform in

response to electric current. In column 5, lines 35-57, *Kimura* describes that a smoothing operation uses a liquid ejecting head capable of ejecting droplets having different sizes. A liquid flow path supplies an ejection outlet for ejecting the liquid. The liquid flow path has a bubble generating heat means used to eject the liquid, the heat means being capable of selectively generating bubbles having different sizes. At least one movable member faces the bubble generation region formed in the liquid flow path. The movable member guides the bubbles to the ejection outlet so as to supply the droplets having different sizes corresponding to the sizes of the bubbles to a boundary region between an image portion and a non-image portion, thereby performing a smoothing operation. In column 16, lines 5-7, *Kimura* describes a drive condition having 24V voltage, 5μs pulse width and a driving frequency of 200Hz.

In contrast to *Kimura*, one aspect of the claimed subject matter is related to the speed of the ejected droplets being constant. In reference to Figures 8-10, Page 16 of the present application describes that while the voltage varies and the size of the ink droplets changes, the speed at which the ink droplets are ejected remains relatively constant. Figure 9 shows a graph of the speed of ejection of the ink droplets in response to the different pulse voltages shown in Figure 8. Figure 10 is a graph showing the volume of the ink droplets ejected in response to the application of the different pulse voltages shown in Figure 8. Figure 9 shows that as the pulse voltages increase, the sizes of the ejected ink droplets increase while the ejection speed remains relatively constant at 5m/s.

Page 9, lines 3-11 of the present application describes that a piezoelectric element is used to drive the different sized ink droplets at relatively constant speeds.

The piezoelectric element is supplied with voltage and distorts. The distortion changes the volume of the channel filled with ink. The change in the volume of the channel allows ink to be ejected from the nozzle provided at the channel, so that recording to recording sheet 2 is performed. Recording sheet 2 is set at a prescribed position and fed in its lengthwise direction.

Claim 39 is amended to define in part that the ink ejection is performed using a piezoelectric element, and a drive waveform applied to the piezoelectric element in ejecting image forming droplets is different from a drive waveform applied to the piezoelectric element in ejecting smoothing droplets.

Rejections under § 102(b)

Claim 39 is rejected as being anticipated by *Kimura*.

Claim 39 is allowable at least because it defines using a piezoelectric element in ejecting ink droplets. *Kimura* does not disclose using a piezoelectric element in ejecting ink droplets. In contrast, *Kimura* uses heat generating elements to heat the ink and create a bubble that drives the ink. The two devices are different for at least that reason and Claim 39 is allowable. Further, there is no indication or suggestion that a piezoelectric device should or could be applied to *Kimura's* device.

Claim 39 is also allowable because it defines applying a waveform in ejecting image forming droplets and a different waveform in ejecting smoothing droplets. *Kimura* does not disclose that subject matter, and instead discloses that a consistent 24V is applied to the heat generating elements. For at least that reason too, Claim 39 is allowable. Further, it would not have been obvious to replace the consistent

24V in *Kimura* with the claimed different drive waveforms at least because there would be no expectation of success or advantage in the context of that disclosure.

Finally, Claim 39 is also allowable at least because *Kimura* does not disclose the subject matter related to maintenance of a constant speed of ejection of the ink droplet forming the smoothing dot and changing the timing of the ejection of the ink droplet forming the smoothing dot, by ejecting the smoothing droplet at the same speed as that of the image forming droplet.

In support of the maintenance of the rejection of Claim 39 as being anticipated by *Kimura*, the Official Action states that because 24V is applied to the heat generating elements 2-1 and 2-2, that the different size ink droplets are necessarily ejected at the same velocity. However, that is simply not the case. As discussed by Applicants in the previous response, *Kimura* discloses a situation where a constant 24V is applied to heat generating elements 2-1 and 2-2 to cause a bubble that ejects different size ink droplets during printing (column 16, line 6). As the volume of ejected ink droplets increases, in the context of *Kimura*, the speed of ejection necessarily decreases, and vice versa. There is no disclosure in *Kimura* that would suggest otherwise to a skilled person. In contrast to *Kimura's* heat generating elements that receive a constant 24V, Claim 39 defines a piezoelectric element that produces the different size ink droplets in response to a variety of drive waveforms. That is, the present Application discusses situations where, by applying certain waveforms, different size ink droplets are ejected at the same velocity. That is not part of the disclosure in *Kimura* and Claim 39 is therefore allowable.

Rejections under § 103(a)

Claims 3, 8 and 34 are rejected as being unpatentable over *Kimura* in view of *Koitabashi*.

Those claims are allowable at least by virtue of their dependence from allowable independent Claim 39, as *Koitabashi* does not remedy the deficiencies of *Kimura*.

Conclusion

For the reasons stated above, it is requested that all the rejections be withdrawn and that this application be allowed in a timely manner.

In the event that there are any questions concerning this response, or the application in general, the Examiner is respectfully urged to telephone the undersigned attorney so that prosecution of the application may be expedited.

Respectfully submitted,

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